crater cones upon the floor of the walled plain *Plato*, which were very variable in visibility; also of several streaks which were not only variable in visibility but also in form; the most usual shape that was observed was that of a trident on the south-west part of the floor. There appeared to be a close connection between the spots and streaks, but its nature was not mentioned in the reports further than a surmise that the appearance of certain streaks appeared to be coincident with an increased visibility of certain spots. Another result was a brightening of the north-west floor, for a time only, as well as a brightening of several of the streaks, but perhaps the most important was that of a *darkening* of the darker parts of the floor as the sun rose higher above its horizon. This result has been most strenuously controverted by a popular writer, who alleges that the effect observed was due only to contrast. Be this as it may, the Report for 1872 is explicit as to a gradual darkening with increased solar altitude; at any rate the same writer bears testimony to the exceptional care with which the floor was scrutinised.

In the year 1876 (May) Neison's "Moon and the Condition and Configuration of its Surface," appeared. It marked an era in selenographical research, the English student having within his reach, for the first time, a description of the principal formations on the moon's surface in his own language. This work, of 576 pages, includes a map drawn in twenty-two sections, the principal formations on each being fully described in the body of the work. Besides the purely topographical part, the author has given five introductory chapters in which he has treated of the physical condition of the surface, the general characteristics of the lunar formations and the variations that have from time to time been detected on the surface. He has also given a most lucid chapter on the history both of the progress of mathematical investigation and selenographical research as regards the moon.

The most important recent event in the progress of selenography was the discovery, on May 19, 1877, by Dr. Klein, of a dark spot which he described as "a great black crater full of shadow without a wall north-west of Hyginus," (NATURE, vol. xviii. p. 197). It was first announced by him in his *Wochenschrift für Astronomie* for March, 27, 1878, and has since been seen by several observers who have generally confirmed the appearances mentioned by him, and also agree in their testimony that no such spot existed formerly in the region in which it was seen. In the celebrated case of Linné the information in 1866-67, as regards the *former* condition of the surface of the moon was so imperfect that it was considered by astronomers that "no change in Linné could have taken place, but that Lohrmann, Beer and Mädler, and Schmidt must have been mistaken." [1] A considerable controversy on this subject occurred during 1867-68, but nearly six months have elapsed since Dr. Klein's announcement, and we have not heard of his discovery having been seriously questioned. It is true that a certain white spot, alleged to have been found on photograms taken within the last fourteen years, has been regarded as indicative of the existence of Klein's crater during those years, and from the probability of its locality being that of Klein's crater, the conclusion has been drawn that the latter is not new. Admitting that a somewhat similar spot existed thirteen years ago, the real nature of which we are unacquainted with, and which may have disappeared in the interim, we are quite as much in the dark as to the real nature of the change ascertained to have taken place by Klein, as to the former existence of the spot discovered by him; both await further elucidation.

The recent publication of Schmidt's large map of the moon in twenty-five sections indicates the latest era of progress. If selenographers apply themselves energetically to examine it, the study of the moon's surface will make great progress; but for this purpose much self-denying labour is indispensable, as the map contains as many as 32,856 craters, exceeding those recorded by Mädler by 25,121. It is important for the true progress of selenography that all of these newly-recorded craters should be observed in such a manner as to leave no doubt of their existence. To effect this each observer should keep his record of observations in the form of a catalogue. In the earlier part of this article we have alluded to the plan adopted by the British Association, viz., of cataloguing every object inserted or to be inserted on its map, and we have also alluded to those publications which contain the descriptions of 710 objects. We believe that a comparison of those publications with Schmidt's map is in progress, and that some of the objects in them are not in Schmidt's map. It is, therefore, certain that, indefatigable as Schmidt has been, if we regard his map as perfect we shall make a great mistake. May we rather endeavour to add to the already large number of objects which he has chronicled.

[1] Neison. "The Moon, and the Condition and Configuration of its Surface," p. 125.

HYDRO-INCUBATION [1]

WE wish that Mr. Christy had used a less barbarous term for his useful apparatus: that, however, is of little consequence to practical men.

At a time when our native farm-yard and dairy produce only supplies about two-thirds of what London and our secondary and third-rate towns need, anything that will assist the unready Saxon in so unsatisfactory a state of things ought to be received with gratitude.

Fowls, in a dietetic point of view, are, we are satisfied, certainly of much more importance than is ordinarily supposed. Let any thoughtful medical man in general practice think what a comfort it would be to him if well-fed young fowls were available for the poorer among his patients, and he will agree with us that such an apparatus as Mr. Christy's may become a great boon. That the masses of the people should be able, in time of illness, to purchase useful wine, the more delicate kinds of fish (such as whiting and soles), fresh eggs, and succulent and tender poultry—these are things desirable to a degree only known to those who are familiar with the treatment of diseases in the homes of the common people. Many a kindly Family Doctor passes from house to house heavy-hearted as well as (too often) overworked; the sad answer to his advice as to regimen being, again and again—"It is easy, Sir, for you to prescribe, but how can we afford these luxuries."

The old remark as to the value of an improvement in the grazing department of the farm, that should "make two blades of grass grow where only one grew before," is now more than ever pertinent. Let our readers look at the Registrar-General's returns for London only, especially in a very healthy season, such as last year, and he will see that the number of the births weekly, as compared to the deaths, is such as to add about *two thousand* hungry mouths to the population in three weeks. Then from all the provinces men and women are pouring into London and the large towns, where they need in the closer air more and better food than would have sufficed them in the country. Therefore we are glad to see energetic merchants like Mr. Christy, bestirring themselves to see what new cattle-food can be found from other climates, and how our rural people can be stimulated and helped to grow and develop for their own benefit and for the benefit of others, food of many kinds that shall be as "manna" to thousands and myriads of hungry people.

But there is another, and much more limited, sphere in which such an apparatus as the "hydro-incubator," will

[1] "Hydro-Incubation in Theory and Practice." By Thomas Christy, F.L.S. Second Edition. (London: 1878.

be of the greatest value. The readers of NATURE will appreciate anything that helps the scientific worker. Now, at last, we are going to the root of things in biology, and only the embryologist knows fully what a boon an egg-hatcher, convenient and easy to work, would be. The eggs of the hen will be wanted in their various stages of incubation, as long as there are workers in these departments, but many other sorts of oviparous animals have to be worked out in all their stages besides the common fowl. Snakes, lizards, tortoises, crocodiles, all these are rivals of the bird in their embryology, and of many kinds the eggs could be procured and their embryos developed if the worker had some such apparatus as Mr. Christy is bringing out. We want, not merely the general embryology of these ovipara, such as is so excellently illustrated and described in Messrs. Foster and Balfour's work, but the special development of any important organ ought to be traced in all its stages through not one, but many types of the vertebrata: through *all* the principal kinds indeed.

Some of us are trying to do this in the skeletal structures; the nervous system, still more important, wants an army of workers, then there are the respiratory, digestive, excretory, and generative organs, all these want a complete history in all their stages, not in one type merely, but in scores of types. We therefore wish well to all energetic and enterprising men who put it into our power to work on a wider scale; such means and appliances as can be brought out by men too restless for close and patient study, may be of infinite service to the close and patient student, who is too dreamy and abstracted to invent for himself. W. K. P.

NOTES ON SOME NATAL PLANTS

GROWING plentifully among the grass on the coast hills of Natal is a small blue flower belonging to the Rubiaceæ. In this plant, generally speaking, there are two forms only, in one of which the five stamens are exserted considerably beyond the tube of the rotate corolla, and the stigma is included in the tube; in this form the tube is almost devoid of hairs. In the other common form the position of these essential organs is reversed, the stigma protruding to about the same extent that the stamens do in the first mentioned, and the stamens being included; here, however, the upper part of the corolla tube is *thickly* covered with downy hairs—of course this is an ordinary dimorphic plant. But I find lately a third form of the same species (only, however, rarely) in which both stamens and stigma are exserted and are of the same length, so that here self-fertilisation must take place, as the stamens and stigma touch at the time the former dehisce. I do not think this can be termed a cleistogamic form, as, although rather smaller and lighter in colour than the others, the difference is only trifling. The hairs which cover the corolla-tube in the form with included stamens serve to keep the pollen collected near the upper part of the tube, as, if it fell to the base it would not be so easily transferred by the proboscis of an insect as when lightly held by the hairs through which the insect must make way. As these hairs would be for this purpose useless when the stamens are exserted they do not occur in the other form.

I notice the same arrangement of hairs in another dimorphic plant belonging, I think, to the same order, which grows on the marshy flats near the sea. I have found on the coast lands here four other plants, in which cross-fertilisation is secured by dimorphism, one of them being a monocotyledonous plant.

There is a species of *Polygonum* which climbs in the bush which well illustrates another plan ensuring cross-fertilisation; while the flower is young and the perianth still closed, enveloping the immature stamens, the three branching stigmas protrude from between the segments in a fit state to receive the pollen. If (as is usual) the ripe stigmas were only exposed when the flower opens, although the evils of self-fertilisation would of course be avoided by the plant being proterogynous, still, as it is wind-fertilised, the perianth and stamens would be in the way of any stray pollen-grains reaching the stigmas; while as it is, nothing interposes between pollen and stigmas.

Lately I have found a curious aberration of form in *Tecoma capense* growing here. It is very common in the bush, forming great beds of bright colour, and normally has a scarlet trumpet-shaped corolla, with one rudimentary and four perfect stamens. I found, however, three or four plants growing within a short distance of each other, in which there were eight perfect stamens; they seemed, however, to have been formed at the expense of the corolla, for there was only one segment coloured at all, the remainder being colourless and small. The ovary seemed in several cases to have been fertilised. The ordinary form of this plant, although individually so brightly coloured, growing in large numbers and secreting much nectar, is seldom or never visited by Lepidoptera. It is, however, frequented by honeysuckers and small bees in numbers. All through the day you can hear the shrill chirp of the small bright honeysucker among the blossoms. The immediate reason why butterflies and moths do not visit it I cannot give; but the stamens and stigma (which are beneath the large upper segment of the corolla) are long, and so high above the opening of the corolla-tube that those insects, in visiting the flower for its nectar, would not be at all certain to touch either, and so in comparison to the honeysucker and small bees would be of little benefit to the plant; for when the former of these visits the flower the feathers of his head are just of the height to brush off the pollen, and the latter in collecting the pollen is equally certain to distribute it, as the bifid stigma is about the same length or only slightly longer than the stamens. Can the nectar have been modified to suit the taste of the useful honeysucker without reference to the useless butterfly?

Natal, June 27 M. S. EVANS

PHYSICS IN PHOTOGRAPHY[1]

III.

THESE last experiments were remarkable in another point of view, as they opened out the question as to whether the salts of silver might not prove sensitive to rays to which they had been supposed hitherto to be insensitive. Silver iodide, for instance, when exposed to the spectrum in a solution of potassium sulphite proved sensitive as far as "*a*" of the spectrum instead of stopping short at the point indicated in Fig. 2 (p. 529); and silver bromide in the molecular grouping which absorbed the red proved sensitive to a wave-length of somewhere near 11,000, whereas in its normal state 9,600 was its limit.

Similarly silver chloride proved sensitive to an extent which presumably may be increased till it is equal to that of the bromide. In both these instances we have a proof that the compound was sensitive to these abnormal rays, and that the image formed by those rays was destroyed as soon as formed by their oxidising action giving an undevelopable form of salt. It may be remarked that by exposing films in reducing solutions such as ferrous sulphate, and pyrogallic acid rendered very slightly alkaline, that an image can be developed as fast as it is formed.

The natural outcome of the experiments on the oxidation of the photographic image just narrated is that it should lead to the solution of the problem of photography in natural colours, such as that of Becquerel, Niepce de St. Victor, and others. In the fourth edition

[1] Continued from p. 531.